

Appl. No.: 10/660,371
Amdt. Dated: 02/10/2005
Off. Act. Dated: 11/10/2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended): An energy control apparatus for a vehicle having an internal combustion engine and a battery, comprising:

a turbocharger adapted to be coupled to said internal combustion engine;

an electric generator adapted to be coupled to said turbocharger and driven by exhaust gas from said internal combustion engine;

said electric generator adapted to be electrically connected to said battery; and means for controlling power output of said electric generator for charging said battery or supplying power to electrical load in said vehicle while said engine is operational;

wherein said turbocharger has a controlled constant or variable outlet pressure by using said electric generator and said battery for altitude compensation or for controlling power output, or for both altitude compensation and controlling power output.

2. (currently amended): An energy control apparatus for a vehicle having an internal combustion engine and a battery, comprising:

a turbocharger adapted to be coupled to said internal combustion engine;

an electric generator adapted to be mechanically driven by said turbocharger;

said electric generator adapted to be electrically connected to said battery; and

means for controlling power output of said electric generator for charging said battery or supplying power to electrical load in said vehicle while said engine is operational;

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wherein said turbocharger has a controlled constant or variable outlet pressure by using the electric generator and battery for altitude compensation or for controlling power output, or for both altitude compensation and controlling power output.

3. (currently amended): In ~~[[an]]~~ a vehicle having an internal combustion engine and a battery, the improvement comprising:

a turbocharger adapted to be coupled to said internal combustion engine;

an electric generator adapted to be coupled to said turbocharger and driven by exhaust gas from said internal combustion engine;

said electric generator adapted to be electrically connected to said battery; and means for controlling power output of said electric generator for charging said battery or supplying power to electrical load in said vehicle while said engine is operational;

wherein said turbocharger has a controlled constant or variable outlet pressure by using the electric generator and battery for altitude compensation or for controlling power output, or for both altitude compensation and controlling power output.

4. (currently amended): In a vehicle having an internal combustion engine and a battery, the improvement comprising:

a turbocharger adapted to be coupled to said internal combustion engine;

an electric generator adapted to be mechanically driven by said turbocharger;

said electric generator adapted to be electrically connected to said battery; and

means for controlling power output of said electric generator for charging said battery or supplying power to electrical load in said vehicle while said engine is operational;

wherein said turbocharger has a controlled constant or variable outlet pressure by using the electric generator and battery for altitude compensation or for controlling power output, or for both altitude compensation and controlling power output.

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5. (currently amended): An energy control apparatus for a hybrid electric vehicle having an internal combustion engine, an electric motor, and a battery power supply, comprising:

a turbocharger adapted to be coupled to said internal combustion engine; and
an electric generator adapted to be mechanically coupled to said turbocharger and electrically connected to said battery power supply;

wherein said electric generator is configured to charge said battery power supply from power provided by said turbocharger[.]; and

wherein said turbocharger has a controlled constant or variable outlet pressure for altitude compensation or for controlling power output, or for both altitude compensation and controlling power output.

6. (original): An energy control apparatus as recited in claim 5, further comprising means for controlling power output of said electric generator for charging said battery power supply while said engine is operational.

7. (currently amended): An energy control apparatus as recited in claim 5, wherein said electric generator is adapted to be electrically connected to said motor and configured to supply at least partial power to said motor from power provided by said turbocharger.

Claims 8-11 (canceled)

12. (currently amended): An energy control apparatus as recited in claim [[9]] 5, wherein said electric generator is adapted to be electrically connected to said motor and configured to supply at least partial power to said motor from power provided by said turbocharger.

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13. (currently amended): An energy control apparatus for a hybrid electric vehicle having an internal combustion engine, an electric motor, and a battery power supply, comprising:

a turbocharger adapted to be coupled to said internal combustion engine; and
an electric generator adapted to be mechanically coupled to said turbocharger and electrically connected to said motor and to said battery power supply;

wherein said electric generator is configured to charge said battery power supply from power provided by said turbocharger; and

wherein said electric generator is configured to supply at least partial power to said motor from power provided by said turbocharger[.]; and

wherein said turbocharger has a controlled constant or variable outlet pressure for altitude compensation or for controlling power output, or for both altitude compensation and controlling power output.

14. (original): An energy control apparatus as recited in claim 13, further comprising means for controlling power output of said electric generator for charging said battery power supply while said engine is operational.

15. (canceled)

16. (currently amended): In a hybrid electric vehicle having an internal combustion engine, an electric motor and a battery power supply, the improvement comprising:

a turbocharger coupled to said internal combustion engine; and
an electric generator mechanically coupled to said turbocharger and electrically connected to said battery power supply;

wherein said electric generator is configured to charge said battery power supply from power provided by said turbocharger[.]; and

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wherein said turbocharger has a controlled constant or variable outlet pressure for altitude compensation or for controlling power output, or for both altitude compensation and controlling power output.

17. (currently amended): An improvement as recited in claim 16, wherein said electric generator is electrically connected to said motor and configured to supply at least partial power to said motor from power provided by the said turbocharger.

18. (original): An improvement as recited in claim 16, further comprising means for controlling power output of said electric generator for charging said battery power supply while said engine is operational.

19. (canceled)

20. (currently amended): In a hybrid electric vehicle comprising an internal combustion engine, an electric motor and a battery power supply, the improvement comprising:

a turbocharger coupled to said internal combustion engine; and
means for charging said battery power supply from power provided by said turbocharger[.];

wherein said turbocharger has controlled constant or variable outlet pressure for altitude compensation, for controlling power output, or for both altitude compensation and controlling power output.

21. (original): An improvement as recited in claim 20, wherein said means comprises an electric generator mechanically coupled to said turbocharger and electrically connected to said battery power supply.

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22. (currently amended): An improvement as recited in claim 20, wherein said electric generator is electrically connected to said motor and configured to supply at least partial power to said motor from power provided by said turbocharger.

23. (original): An improvement as recited in claim 21, further comprising means for controlling power output of said electric generator for charging said battery power supply while said engine is operational.

24. (canceled)

25. (currently amended): A hybrid electric vehicle, comprising:
an internal combustion engine;
an electric motor;
a battery power supply coupled to said electric motor;
a drivetrain configured to be coupled to said engine and said motor;
a turbocharger coupled to said internal combustion engine; and
means for charging said battery power supply from power provided by said turbocharger[.];

wherein said turbocharger has a controlled constant or variable outlet pressure for altitude compensation or for controlling power output, or for both altitude compensation and controlling power output.

26. (original): A hybrid electric vehicle as recited in claim 25, wherein said means comprises an electric generator mechanically coupled to said turbocharger and to said battery power supply.

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27. (currently amended): A hybrid electric vehicle as recited in claim 25, wherein said electric generator is electrically connected to said motor and configured to supply at least partial power to said motor from power provided by said turbocharger.

28. (currently amended): A hybrid electric vehicle as recited in claim 25, further comprising means for controlling power output of said electric generator for charging said battery power supply while said engine is operational.

29. (canceled)

30. (currently amended): A hybrid electric vehicle, comprising:
an internal combustion engine;
an electric motor;
a battery power supply coupled to said electric motor;
a drivetrain configured to be coupled to said engine and said motor;
a turbocharger coupled to said internal combustion engine; and
an electric generator mechanically coupled to said turbocharger and electrically connected to said battery power supply;
wherein said electric generator is configured to charge said battery power supply from power provided by said turbocharger[.];

wherein said turbocharger has a controlled constant or variable outlet pressure for altitude compensation, for controlling power output, or for both altitude compensation and controlling power output.

31. (original): A hybrid electric vehicle as recited in claim 30, further comprising means for controlling power output of said electric generator for charging said battery power supply while said engine is operational.

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32. (currently amended): A hybrid electric vehicle as recited in claim 30, wherein said electric generator is electrically connected to said motor and configured to supply at least partial power to said motor from power provided by said turbocharger.

33. (canceled)

34. (currently amended): A hybrid electric vehicle, comprising:
an internal combustion engine;
an electric motor;
a battery power supply coupled to said electric motor;
a drivetrain configured to be coupled to said engine and said motor;
a turbocharger coupled to said internal combustion engine; and
an electric generator mechanically coupled to said turbocharger and electrically connected to said motor and to said battery power supply;
wherein said electric generator is configured to charge said battery power supply from power provided by said turbocharger; and
wherein said electric generator is configured to supply at least partial power to said motor from power provided by said turbocharger[.];
wherein said turbocharger has a controlled constant or variable outlet pressure for altitude compensation or for controlling power output, or for both altitude compensation and controlling power output.

35. (canceled)

36. (currently amended): A hybrid electric vehicle as recited in claim 34, further comprising means for controlling power output of said electric generator for charging said battery power supply while said engine is operation.

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37. (currently amended): A power control method for a hybrid electric vehicle having an internal combustion engine, an electric motor, and a battery power supply, comprising:

coupling a turbocharger to said internal combustion engine;

coupling an electric generator to said turbocharger and to said battery power supply;

using said turbocharger to compensate for power loss in said internal combustion engine; and

charging said battery power supply from power provided by said turbocharger;

wherein said turbocharger has a controlled constant or variable outlet pressure by using said electric generator and said battery for altitude compensation or for controlling power output, or for both altitude compensation and controlling power output.

38. (currently amended): A method as recited in claim 37, further comprising powering said motor from said electric generator.

39. (currently amended): A power control method for a hybrid electric vehicle having an internal combustion engine, an electric motor, and a battery power supply, comprising:

using a turbocharger to compensate for power loss in said internal combustion engine; and

using power from said turbocharger to drive [[a]] an electric generator configured for charging said battery power supply;

wherein said turbocharger has a controlled constant or variable outlet pressure by using said electric generator and said battery for altitude compensation or for controlling power output, or for both altitude compensation and controlling power output.

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40. (original): A method as recited in claim 39, further comprising powering said motor from said generator.

41. (new): An apparatus as recited in claim 1, wherein driving said electric generator with said turbocharger and charging said battery with said electric generator can improve volumetric efficiency and effective thermal efficiency of said internal combustion engine.

42. (new): An apparatus as recited in claim 2, wherein driving said electric generator with said turbocharger and charging said battery with said electric generator can improve volumetric efficiency and effective thermal efficiency of said internal combustion engine.

43. (new): An apparatus as recited in claim 5, wherein charging said battery power supply from power provided by said turbocharger can improve volumetric efficiency and effective thermal efficiency of said internal combustion engine.

44. (new): An apparatus as recited in claim 13, wherein charging said battery power supply from power provided by said turbocharger can improve volumetric efficiency and effective thermal efficiency of said internal combustion engine.

45. (new): An improvement as recited in claim 3, wherein driving said electric generator with said turbocharger and charging said battery with said electric generator can improve volumetric efficiency and effective thermal efficiency of said internal combustion engine.

46. (new): An improvement as recited in claim 4, wherein driving said electric generator with said turbocharger and charging said battery with said electric generator

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can improve volumetric efficiency and effective thermal efficiency of said internal combustion engine.

47. (new): An improvement as recited in claim 16, wherein charging said battery power supply from power provided by said turbocharger can improve volumetric efficiency and effective thermal efficiency of said internal combustion engine.

48. (new): An improvement as recited in claim 20, wherein charging said battery power supply from power provided by said turbocharger can improve volumetric efficiency and effective thermal efficiency of said internal combustion engine.

49. (new): A hybrid electric vehicle as recited in claim 25, wherein charging said battery power supply from power provided by said turbocharger can improve volumetric efficiency and effective thermal efficiency of said internal combustion engine.

50. (new): A hybrid electric vehicle as recited in claim 30, wherein charging said battery power supply from power provided by said turbocharger can improve volumetric efficiency and effective thermal efficiency of said internal combustion engine.

51. (new): A hybrid electric vehicle as recited in claim 34, wherein charging said battery power supply from power provided by said turbocharger can improve volumetric efficiency and effective thermal efficiency of said internal combustion engine.

52. (new): A method as recited in claim 37, wherein using power from said turbocharger to drive a generator configured for charging said battery power supply can improve volumetric efficiency and effective thermal efficiency of said internal combustion engine.

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53. (new): A method as recited in claim 39, wherein charging said battery power supply from power provided by said turbocharger can improve volumetric efficiency and effective thermal efficiency of said internal combustion engine.